

POWER REQUIRED TO PERFORM SEVERAL OF THE FUNCTIONS OF A SMALL MOTOR, AND CORRESPONDING COST OF WATER FOR THE TURBINE, *under the same conditions as to Pressure, &c., as those obtaining during the experiments.*

	Foot Pounds of Work per Minute.	Cost of Water per Hour.
		Pence.
Supplying wind to a small organ of 6 stops, using full organ	372	·41
Driving an ordinary sewing-machine...	416	·46
Turning a 16-in. grindstone for grinding carpenters' tools	2000	2·22
Driving a foot-lathe, turning wood or metal, average work	1350	1·50
	Foot Pounds per Annum.	Cost per Annum.
Winding-up a large turret-clock, such as that at the Richmond Town Hall	8,000,000	12/4

ART. XII.—*On the Yarra Dialect and the Languages of Australia in connexion with those of the Mozambique and Portuguese Africa.*

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[Read November 13th, 1879.]

IN Mr. R. Brough Smyth's great work, *The Aborigines of Australia* (Melbourne, 1878), there will be found in the second volume much matter on the languages of Australia. Among these will be found a very long vocabulary of the Yarra dialect, of the Yarra River, of Melbourne, composed by Mr. John Green, Inspector of Aborigines.

Unfortunately, many common words are left out, so that comparison can only be imperfect. However, I found on examination that it compares directly with a body of languages in Portuguese Africa, being Class XI. of Koelle's Polyglotta Africana, and comprising Muntu, Kiriman, Marawi, Metó, Malatau, and Nyambau, being the languages of Mozambique. The words outside of Class XI. are found in Class X., being Bantu or Kaffir languages of Portuguese, Western, and Central Africa, being Congo, &c. Some words are found in Class IV. which is related to Class X.

The following list will show this, the Class X. words being thus marked []:—

	YARRA.		AFRICA.
<i>Man</i>	... kolise (koli)	...	[akala, Mugentandu]
<i>Woman</i>	... bazarrook bajor	...	[baketo, Nyombe] [badshento, Kabenda]
<i>Daughter</i>	... munggup	...	moanaka
<i>Father</i>	... marmun	...	(mama, mother)
<i>Mother</i>	... baboop	...	(baba, father)
<i>Brother</i>	... bangannoo	...	panginndenge
<i>Sister</i>	... latingata	...	ndengetu
<i>Eye</i>	... mee, merring	...	meso
<i>Tooth</i>	... leeang	...	leeno
<i>Navel</i>	... moondok	...	matoku
<i>Knee</i>	... barreng	...	bondo
<i>Bone</i>	... ma-lingo	...	likuwa
<i>Skin</i>	... morrok	...	[mungoto, lubalo]
<i>Beak</i>	... barrgin-boon	...	poono
<i>Knife</i>	... kal-been	...	mu-kalo mbene
<i>Axe</i>	... karrgeen	...	koangoa
<i>Spear</i>	... goeeon	...	[ngaya, lubalo]
<i>Stone</i>	... moojerr	...	moara
<i>Coal</i>	... kanendurr	...	kala
<i>Rope</i>	... woodel	...	[wondi, Mbamla]
<i>Stick</i>	... kalk	...	[koko, Kabenda]
<i>Leaf</i>	... jerrang	...	[jish, Bumbete]
<i>Yam</i>	... barrm	...	[mbala, Kabenéa]
<i>Cat</i>	... bede-dil	...	[budi, Mimboma]
<i>Mosquito</i>	... gogook	...	[ngomgu, Mbamla]
<i>Lizard</i>	... tourroop	...	tabarrada
<i>Little</i>	... wy-krook	...	[watola] [kasanj] to-kieve, Bumbete
<i>White</i>	... lam-borreen	...	[a-pfurau]
<i>Black</i>	... woo-gar-ring	...	woo-ripa

	YARRA.		AFRICA.	
<i>Young</i>	...	boop	...	[biop, Kanyika]
<i>Warm</i>	...	loom-badin	...	[a-domu, Melon]
<i>Go</i>	...	yani	...	[yami, lubalo]
<i>Come</i>	...	wandeat	...	uta
<i>Cough</i>	...	kooningoon	...	[ekona, Orangu]
<i>Die</i>	...	wykit	...	ukoa
<i>War</i>	...	ngatang	...	ngondo koto
<i>Sun</i>	...	ngumi	...	[ekombi, Bugela] [nkima ; moon, lubalo]
<i>Moon</i>	...	meene-an	...	[moanya ; sun, lubalo]
<i>Sky</i>	...	woorwarra	...	wa-moluku
<i>Day</i>	...	karremeen	...	[muini, Musentandu]
<i>Night</i>	...	boerren	...	[buila, Kabenda]
<i>Rain</i>	...	al	...	epula
<i>Don</i>	...	warrong	...	[ewuru, Sobo]
<i>Fall</i>	...	baderin	...	[buidi, Kabenda]
<i>Sit</i>	...	ngalimbe	...	kala
<i>Dream</i>	...	yiook-gen	...	gona
<i>Give</i>	...	woonga	...	wunya
<i>Cut</i>	...	bundi	...	[batura, Kasonj]
<i>Catch</i>	...	banga-gat	...	[quata, Kasonj]
<i>Two</i>	...	bollo-wun	...	beli, peli

To the Yarra model belong Kabi, Gunbower, Tyntyndyer, Glenorchy, Horsham, Upper Richardson, Balmoral, Hamilton, Wickliffe, Avoca, Daylesford, Goulburn, Witouro, Jajou-rong, Kreen-koren-werro, Burapper, Ta-orungurong, &c.

As a further test, beyond the one Mozambique language answering to the Yarra, if we take other Australian roots, we shall find their correspondents in the other languages of the Mozambique. Thus, five roots for "man" and three for "hair" admit of being so compared.

The Echuca, Morcovia, and Sandford particularly show this, and the results are obtained from Moreton Bay, in North Australia; New South Wales in the east, and from Western Australia.

The following table illustrates this:—

	AUSTRALIA.		KIRIMANDI, AFRICA.					
<i>Man</i>	...	Echuca	...	moanit	...	moanna	...	Marawi
		Yelta	...	maalee	...	mulo	...	Kiriman
		Morcovia	...	nunna	...	nona	...	Nyamban
		Balmoral	...	beng	...	boana	...	Marawi
<i>Head</i>	...	Gunbower	...	moorun	...	muru	...	Kiriman

	AUSTRALIA.		KIRIMANDI, AFRICA.	
<i>Hair</i>	Wickliffe	... marah	... murit	... Kiriman
	Yarra	... yarro	... ikarare	... Muntu
	Gippsland	... leet	... lefu	... Mutsaya
<i>Ear</i>	Echuca	... boka	... [mbeta	... Kisama]
	Echuca	... marrmo	... maro	... Matabau
<i>Tooth</i>	Yarra	... woorring	... nyaru	... Marawi
	Echuca	... derra	... dino	... Nyamban
	Sandford	... tungung
<i>Mouth</i>	Yarra	... leelang	... leeno	... Marawi
	Sandford	... mullong	... malagu	... Meto
	Morcovia	... moun	... [munua	... Kabendo]
<i>Sun</i>	Hamilton	... kone	... [li-kano	... Lubalo]
	Bulloo	... tuni	... etana	... Muntu, day
	Yarra	... ngume	... [tangu	... Kabenda]
<i>Two</i>	Moreton Bay	bullae	... [ekombi	... Pangela]
	Yarra	... bollo-ween	... beli	... Kiriman
<i>I</i>	N. S. Wales..	pulla	... peli	... Kiriman
	Victoria	... ngie	... ni	... Muntu
		... ngan	... ne	... Nyamban
	S. Australia..	ngu		

It is very seldom that we can so distinctly lay down languages which are really related but widely distributed. There is, therefore, no mistake that the language of the Melbourne tribes is of common origin with those of Mozambique.

A curious circumstance will be noticed that, though the words may differ internally, they commonly begin with the same consonants in both continents. This serves to mark them; for in the class of languages to which they belong, the Bantu or Kaffre, the initial syllable is of great import.

This brings us direct to papers of the greatest authority on the Bantu languages, the late Dr. W. H. Bleek, contributed by him, at the request of Professor Huxley, to the Anthropological Society and Institute, and to be found in Vol. I. of the *Journal* of the Anthropological Institute.

From the consideration of the grammatical points, Dr. Bleek was fully convinced that the Australian languages were related to the Bantu, and this he develops in a most remarkable paper on general philology.

Here, too, he examines what another great comparative philologist (Bishop Caldwell) had done in the comparative grammar of the Dravidian languages as to the wonderful identity of the Australian first personal pronoun with the

Dravidian and some other Indian languages. Caldwell was, however, unable to trace detailed resemblances. The observations of Dr. Caldwell are, however, as worthy of careful perusal as those of Dr. Bleek.

The latter was near seizing the whole truth as to the Australian languages, but missed, first, from devotion to a theory he had laid down of subdividing languages as a type for classification. Next, he failed from the besetting mania of philologists of regarding chiefly grammatical forms, and disregarding words.

Were it not for these circumstances, Dr. Bleek, with his intimate knowledge of the Bantu family, must have identified the facts here given. Strangely enough, in the same volume of the *Anthropological Journal* is a paper and comparative table of Australian languages by the Rev. George Taplin, which contain the words.

Dr. Bleek recognised the connection of mythology with language, and the fact that the mythology of Australia is related to that of other regions.

The practices and culture of Australia are well enough known to present many features in common with those of the rest of the world, and the relation of an Australian mummy was only a few weeks ago illustrated by Professor W. H. Flower at the Anthropological Institute.

In order to explain the ground on which the observations of Dr. Caldwell and Dr. Bleek rest, it may be useful to refer to those which were made by me on the 22nd November, 1870 (*Journal*, p. 84). It results from the course of inquiry then instituted by me, that the Australian belong to a group of languages (and in this term I conform with Dr. Bleek), to which also belong the Bantu and the Dravidian.

These languages, although developed in common and from the same sources, constitute a group. Thus the result is that roots may be differently selected in Australian, Bantu, and Dravidian, and will not fit in together in each case notwithstanding their common origin. The resemblance between the Yarra languages and the Mozambique languages is, as already stated, much closer than is commonly found.

It has been the opinion of some distinguished anthropologists that Australia is a centre of the human race, from which India and Africa were peopled. However this may be, the facts now brought forward are, so far as language is concerned, in proof of the direct contrary. Africa, so far as

this evidence is concerned, is the great centre of languages, of mythology, and of civilisation.

As in another paper contributed by me High Africa has been treated on as a centre of culture, it is not necessary to go into the whole subject here.

The Australian languages will be found to belong to one of the earliest epochs of development of language in this group, but I am of opinion that the testimonies brought forward in Mr. Brough Smyth's work as to Australia having been, at some former period, under the influence of a white race, are correct.

As such, I should class, which I cannot now account for, though I have an hypothesis not yet tested, the curious circumstance that the names of languages in Australia are negatives. Now, a whole section in my prehistoric and protohistoric comparative philology and mythology is devoted to the exemplification of this remarkable characteristic of a negative series. Now one language is called the Kabi, and Kaba figures largely in many languages of the old world as a negative.

Mr. R. Brough Smyth, in *The Aborigines of Victoria*, Vol. II., page 8 (Trubner, 1878), says:—

“A great many of the languages of Australia are named after the word ‘no.’ The late Mr. Bunce states that the Melbourne people used to designate their language the words ‘Nuther galla,’ nuther meaning ‘no.’

“The late Mr. E. S. Parker corroborates Mr. Bunce's statement. He says:—The natives distinguish the different talle, or languages, by their negations. Thus there is the Burapper dialect, spoken by the Mallegoondet; the Utar dialect, on the Murray and Lower Goulburn—these words, Burapper and Utar, being respectively the negations of each language; and so of others.

“This system of nomenclature appears to prevail in the eastern and southern parts of the continent.

“The Rev. W. Ridley, M.A., eminent amongst the philologists of Australia, says the following are the names of some languages spoken in the interior:—1, Kamilaroi; 2, Wolaroi; 3, Wiraiaroi; 4, Wailwria; 5, Kogai; 6, Pikumbul; 7, Paiamba; 8, Kingi. The first five of these are named after their negatives. In the first, Kamil signifies ‘no;’ in the second, Wol is ‘no;’ in the third, Wira is ‘no;’ in the fourth, Wail is ‘no;’ in the fifth, Ko is ‘no.’ In Pikumbul, on the other hand, Piku means ‘yes.’”

Indeed, the whole evidence is in confirmation of what has been stated by me (*Prehistoric Comparative Philology and Mythology*. London: Trubner), that under the doctrine of the four worlds, taught in the school of Pergamos, the ancients preserved a knowledge of what was known to their predecessors in Babylon. The Austral world, which in the globe balanced our world, was Australasia, as in the other hemisphere the north and south worlds were North and South America.

Thus the knowledge of this intercourse was long lost, until now we can restore a passage of many thousands of years old in the history of Australia.

ART. XIII.—*Observations of the Outer Satellite of Mars in 1879.*

By E. J. WHITE, F.R.A.S.

[Read December 4th, 1879.]

As is now well known, the satellites of Mars were discovered by Professor Hall, of the Washington Observatory, by means of the magnificent refractor of 26 inches aperture, constructed for that establishment by the celebrated makers, Alvan Clark and Son, of Boston. Deimos, the outer satellite, was first seen on August 11th, 1877, and Phobos, the inner satellite, on the 17th of the same month.

Assisted by the positions furnished by the Washington astronomers, several observers in Europe and America managed to see these minute bodies, which in the most powerful telescopes appear as mere specks of light, with no measurable disc. Estimates, however, of their dimensions have been made from the intensity of their light, from which the diameter of the inner one has been fixed at from ten to forty miles, and the outer one between five and twenty miles. A little time after their discovery the Astronomer Royal, Sir George Airy, announced the fact to us in a telegram, and a search was at once instituted with the 4-foot reflector and 8-inch refractor of the Melbourne Observatory, but our efforts were not rewarded with success.